10-24 — 525 Rec'd PCT/PTO 23 OCT 2000

FORM PTO-1390 (Modified) (REV 11-98) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER	
990.1240	
U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR)	
09/673981	
INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE
PCT/FI99/00321	April 21, 1999
PRIORITY DATE CLAIMED	
April 24, 1998	

TITLE OF INVENTION
REEL-UP

APPLICANT(S) FOR DO/EO/US
Heikki NISKANEN

OIPE OCT 23 2000 JC13 PATENT & TRADEMARK OFFICE

MAILING DATE OCT 24 PATENT & TRADEMARK OFFICE CANCELLED

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
   a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ A copy of the International Search Report (PCT/ISA/210).
8. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ have been transmitted by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☒ have not been made and will not be made.
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 20 below concern document(s) or information included:

13. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☒ Certificate of Mailing by Express Mail
20. ☒ Other items or information:

Letter Re Priority

PCTUS1/REV03

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U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
09/673981	PCT/FI99/00321	990.1240

21. The following fees are submitted:.

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

		CALCULATIONS PTO USE ONLY
☐	Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2) paid to USPTO and International Search Report not prepared by the EPO or JPO	$970.00
☒	International preliminary examination fee (37 CFR 1.482) not paid to USPTO but Internation Search Report prepared by the EPO or JPO	$840.00
☐	International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO	$690.00
☐	International preliminary examination fee paid to USPTO (37 CFR 1 482) but all claims did not satisfy provisions of PCT Article 33(1)-(4)	$670.00
☐	International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4)	$96.00

ENTER APPROPRIATE BASIC FEE AMOUNT =	$840.00	
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).	$0.00	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	13 - 20 =	0	x $18.00	$0.00	
Independent claims	3 - 3 =	0	x $78.00	$0.00	
Multiple Dependent Claims **(check if applicable).**			☐	$0.00	
TOTAL OF ABOVE CALCULATIONS =				$840.00	
Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) **(check if applicable).**			☐	$0.00	
SUBTOTAL =				$840.00	
Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).			+	$0.00	
TOTAL NATIONAL FEE =				$840.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) **(check if applicable).**			☒	$40.00	
TOTAL FEES ENCLOSED =				$880.00	
				Amount to be: refunded	$
				charged	$

☒ A check in the amount of **$880.00** to cover the above fees is enclosed.

☐ Please charge my Deposit Account No. in the amount of to cover the above fees.
A duplicate copy of this sheet is enclosed.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. **50-0518** A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

STEINBERG & RASKIN, P.C.
1140 Avenue of the Americas, 15th Floor
New York, New York 10036-5803

SIGNATURE

Martin G. Raskin
NAME

25,642
REGISTRATION NUMBER

October 23, 2000
DATE

990.1240

UNITED STATES PATENT AND TRADEMARK OFFICE

Re:	Application of:	Heikki NISKANEN et al.
	Serial No.:	Not yet known
	Filed:	Simultaneously
	For:	**REEL-UP**

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

October 23, 2000

Sir:

Prior to examination, please amend the above-identified application as follows:

IN THE SPECIFICATION:

Please amend the specification as follows (reference is to the lines as numbered).

Page 1, line 5, insert --**FIELD OF THE INVENTION**--;

Page 1, line 6, delete entire sentence and insert therefor the following:

--The present invention relates to a reel-up/winder and in particular a reel/up winder for use in a paper/board machine.--

Page 1, line 7, insert --**BACKGROUND OF THE INVENTION**--.

Page 3, line 16, insert --**OBJECTS AND SUMMARY OF THE INVENTION**--.

Page 3, lines 22-23, delete entire sentence.

Page 4, line 8, insert --**BRIEF DESCRIPTION OF THE DRAWINGS**--

Page 4, line 26 insert --**DETAILED DESCRIPTION OF THE INVENTION**--.

IN THE CLAIMS:

Please amend the claims as amended under Article 34 as follows.

Claim 4, line 1, change "any of the claims 1 to 3" to --claim 1--.

Claim 5, line 1, change "any of the claims 1 to 4" to --claim 1--.

Please add the following new claims:

6. A reel up/winder comprising:

a reel spool for forming a roll, said reel spool having an axis;

a support assembly comprising at least a first roll, at least a second roll and a belt arranged around said at least a first roll and said at least a second roll, wherein said at least first roll and said at least second roll each have an axis substantially parallel to said axis of said reel and wherein one of said at least a first roll and said at least a second roll has a substantially spiral shaped groove pattern formed on a outer surface of said roll, said groove pattern extending along an axially width of said roll.

7. The reel up/winder according to claim 6, further comprising a first winding drum and wherein said first winding drum is arranged such that said paper web runs through a first nip defined by said first wand drum and said reel and then through a second nip defined by said at least first roll of said support assembly.

8. The reel up/winder according to claim 6, further comprising a reel cylinder arranged before said reel spool in a direction of travel of said web.

9. The reel up/winder according to claim 6, wherein a depth of said groove is about .3 to about 1.5 mm.

10. The reel up/winder according to claim 9, wherein the depth of said groove of said groove is about .3 to about 1.0 mm.

11. The reel up/winder according to claim 6, wherein a width of said groove is about 20 to about 150 mm.

12. The reel up/winder according to claim 11, wherein the width of said groove is about 35 to about 100mm.

13. A reel up/winder comprising:

a reel spool for forming a roll, said reel spool having an axis;

a reel cylinder arranged before said reel spool in a direction of travel of a web;

a endless belt arranged around a plurality of guide rolls, said endless belt structured and arranged to guide said web through a nip defined between said reel cylinder and said reel spool;

wherein an outer face of a mantle of said reel cylinder has a substantially spiral shaped groove formed therein, said groove extending across an axial width of said reel cylinder.

REMARKS

It is respectfully requested that the amendments to the claims made under Article 34 in response to the International Preliminary Examination Report be entered for purposes of the present application.

The specification has been amended to include section headings at appropriate locations.

Claims 4 and 5 have been amended to remove multiple dependencies therefrom in order to reduce the filing fee. In addition, new claims 6-13 have been added which are directed to embodiments of the invention disclosed in the original specification. It is respectfully submitted that no new matter has been added.

Respectfully submitted,
STEINBERG & RASKIN, P.C.

By // Paul J. Higgins
Reg No. 44,152

Martin G. Raskin
Reg. No. 25,642

Steinberg & Raskin, P.C.
1140 Avenue of the Americas
New York, New York 10036
(212) 768-3800

Reel-up

The invention concerns a reel-up/winder as defined in the preamble of claim 1.

In reeling or winding of paper or of a corresponding web-like material, commonly a drum winder or a what is called Pope-type reel-up is used. In a drum winder, there are two winding drums, on which the paper roll is formed. The paper roll that is being formed is loaded by means of a rider roll, which is fitted in contact with the top face of the paper roll. From a drum winder, further a winder with a set of belt rolls has been developed, in which one of the winding drums has been substituted for by an arrangement of a support belt. In a Pope-type reel-up, the reel is formed by means of a reel cylinder so that the web is passed through the nip formed between the reel cylinder and the reel spool onto the reel spool.

In the applicant's *FI Patent No. 74,260 (equivalent US Patent 4,801,758)*, an example is described of a winder with a set of belt rolls placed after a slitter. The device comprises support members for supporting the roll that is being formed at least primarily by means of circumferential support and loading members for keeping the roll against the support members. The support members comprise a winding drum and a mobile support-web member, which supports the roll that is being formed over a considerable length of the circumference. Loading members press the roll against the winding drum and/or against the rigidly or displaceably supported support member of said support-belt member. The support-belt arrangement comprises a frame, to which two support rolls, an alignment roll and a tensioning roll have been attached. On the rolls, an endless support belt is supported, which can also be composed of a number of belts fitted side by side. The roll that is being formed is supported by means of the winding drum as well as by means of the portion of the support belt placed between the support rolls. One of the support rolls and the tensioning roll have been attached to the frame by means of an articulated

arm, in which connection the position of the support belt in relation to the roll that is being formed can be regulated.

In the applicant's *FI Patent No. 94,231 (equivalent US Patent 5,531,396)*, an example is described of a Pope-type reel-up for a machine-width web, which device makes use of a support belt. The reel-up comprises a reel cylinder and a first reel spool, which is in nip contact with the reel cylinder when the web is reeled through the nip onto the first reel spool, and the reel-up comprises a transfer device for the transfer of an empty second reel spool into nip contact with the reel cylinder when the first reel is complete. The reel-up also comprises a belt for supporting the web and for passing the web over the reel cylinder as well as a displaceable belt alignment roll, which has been arranged inside the belt loop and which can be transferred into nip contact with the reel placed on the first reel spool. The reel-up further comprises devices for the transfer of said belt alignment roll and of said first reel, while in nip contact, into a change position so that the web is supported by means of said belt and that the web runs through a nip formed between the belt alignment roll and said first reel.

In the *FI Patent 90,853* (Jagenberg Aktiengesellschaft), a loading roll for use in a reeling/winding device has been described, at which the outer face of the roll mantle is provided with a number of grooves extending across its entire width. Said grooves pass favourably as spiral-shaped at an angle of about 15° in relation to the longitudinal axis of the loading roll. Any air that has penetrated between the topmost web layer and the winding drum is carried in the grooves through the gap between the loading roll and the reel cylinder. In such a case, the air is distributed evenly, and no detrmental effects, such as folds, occur.

In reeling and winding, air is carried along with the web, which air can form an air cushion in the gap between the reel cylinder and the web in the reeling/winding nip. In the outer face of the mantle of the reel cylinder, it is possible to use relatively narrow, steep and deep grooves parallel to the circumference of the mantle, by means of which grooves the air that is carried into the gap between the web and the

reel cylinder can be passed through the nip. In this way, a situation is avoided in which the reel cylinder loses its contact with the web. Out of the gap between the web and the reel/roll that is being formed, air is also always carried along with the web through the reeling/winding nip. This air is carried between the outermost web layer and the reel/roll into the following reeling/winding nip, in which it can easily form an air bag ahead of said reeling/winding nip. In prior-art reeling/winding devices in which a set of belt rolls is used in order to support and/or to carry the reel/roll that is being formed, this air bag is eliminated by means of grooves that have been formed into the outer face of the belt of the set of belt rolls, by means of which grooves the air placed under the outermost web layer is allowed to be discharged through the nip and also to be guided in the axial direction of the roll out of the ends of the reel/roll. Since the belt is worn in operation and since the groove must operate in the same way during the entire service life of the belt, a relatively deep groove must be made into the belt face. This is why the service life of the belt becomes shorter and the noise level higher.

By means of the solution in accordance with the present invention, the air bag can be eliminated ahead of the nip of the set of belt rolls from between the outermost web layer and the reel/roll without necessity to make grooves into the outer face of the belt.

The principal characteristics of the device in accordance with the invention have been presented in the characterizing part of claim 1.

The invention is suitable for use in all such reeling or winding devices in which the roll/reel to be formed on a reel/roll spool is supported by means of at least one support device based on belt support. Of the rolls placed inside the belt loop, one or several can be provided with a groove arrangement in accordance with the invention. At least those rolls placed inside the belt loop which form a nip with the reel/roll to be formed onto a reel/roll spool should preferably be provided with a groove arrangement in accordance with the present invention.

When the grooves are made onto a belt roll that forms a nip in stead of being made onto the belt, the manufacture of the belt is simplified. The belt manufacturer does not need a great number of different tools for the manufacture of belts provided with different grooves. The same belt can be used on belt rolls provided with different groove patterns. A simpler belt also has the consequence that a greater number of manufacturers are willing to manufacture belts, in which case the buyer obtains the advantage of increased competition.

The invention will be described in the following with reference to the figures in the accompanying drawings, the invention being, however, not supposed to be confined to the details of said illustrations alone.

Figure 1 is a schematic illustration of an exemplifying embodiment of a drum winder provided with a set of belt rolls, to which winder the solution in accordance with the present invention can be applied.

Figure 2 illustrates an exemplifying embodiment of a Pope-type reel-up for a machine-width web which makes use of a support belt, to which device the solution in accordance with the present invention can also be applied.

Figure 3 shows a prior-art roll construction for use in a reeling/winding device that makes use of a belt support.

Figure 4 shows a roll construction in accordance with the present invention for use in a reeling/winding device that makes use of a belt support.

Fig. 1 shows a drum winder, in which a first winding drum 11 is shown, onto whose lower face the paper web W is introduced in the direction of the arrow S, and in which a second winding drum system 12 and a paper roll 10 to be formed on said drums are shown. The paper roll 10 is loaded with a rider roll 17. The second winding drum system 12 consists of a set of belt rolls, in which there are a first 13 and a second 14 belt roll, and of an endless belt 15 that surrounds said rolls. The

belt 15 is favourably composed of at least two separate belts, which have been fitted side by side in the direction of the axes of the belt rolls 13, 14. By means of such a support by means of a set of belt rolls, a softer support of the paper roll 10 is obtained, in which case larger paper rolls can be formed without winding defects which arise from high nip loads. The paper web W runs through the first nip NP_1 between the first winding drum 11 and the paper roll 10 that is being formed and through the second nip NP_2 between the second winding drum system 12 and the paper roll 10 that is being formed and is wound onto the roll spool 16.

Along with the web W, air is carried through the first nip NP_1 into the gap between the web and the roll that is being formed. This air is carried further to ahead of the second nip NP_2, where the air present between the roll 10 and its outermost web layer forms an air bag in front of the second nip NP_2. This air bag causes defects in the roll 10, and therefore it is necessary to prevent formation of an air bag. In prior-art solutions, formation of an air bag is prevented so that grooves have been made into the outer face of the belt 15, by means of which grooves any air that has been packed under the outermost web layer in the roll 10 is allowed to pass through the second nip NP_2.

In the situation shown in Fig. 1, the belt 15 runs exclusively around two belt rolls 13,14, but the invention can, of course, also be applied in a situation in which the belt 15 has been passed to run on support of several rolls, as is the case, for example, in the applicant's said FI Patent 74,260.

Fig. 2 shows a Pope-type reel-up in accordance with the applicant's said FI Patent No. 94,231. This reel-up will be described herein exclusively in respect of the parts that are related to the present invention. The main part of the reel-up consists of a reel cylinder 30, along with whose circumference the web W runs before it is transferred onto the circumference of the reel 10 that is being formed around the reel spool 16. The reel spool 16 rests and revolves in a reeling position, for example, on support of two support rails 35. The reel-up further comprises a belt 34, which runs as guided by guide rolls 31,32,33 and through the nip N between the reel cylinder

30 and the reel 10. The belt 34 supports the web W when the web arrives in the reel-up and until the web W is wound around the reel 10 that is formed on the reel spool 16. The belt 34 extends in the cross direction of the machine substantially across the entire width of the machine. The running direction of the web W and of the belt 34 is denoted with the arrow S, and empty reel spools placed in a stand-by position are denoted with the reference numerals 16',16",16'".

The belt 34 can be tensioned by means of a guide roll 33 moving substantially in a horizontal plane, and the guide roll 31 can also be shifted to the right in a substantially horizontal plane. In a situation of change of reel spool 16, a new reel spool 16' is first transferred into nip contact with the reel cylinder 30. After this, the guide roll 31 is transferred into nip contact with the reel 10, after which the reel 10 and the guide roll 31 are transferred, while the nip contact between them is maintained, along the support rails 35, to the right in the figure, into the change position. After this the new reel spool 16' is transferred, while the nip contact with the reel cylinder 30 is maintained, onto the rails 35 to the reeling position, after which the web W is cut off and transferred so that it is reeled around the new reel spool 16'.

Also in this Pope-type reel-up, in which the reel 10 is supported by means of a belt 34 between the reel cylinder 30 and a guide roll 31, the problem mentioned above occurs. Along with the web W, air is carried through the nip N between the reel cylinder 30 and the reel 10 in between the outermost web layer and the reel. This air is carried between the outermost web layer and the reel 10 again to ahead of the nip N between the reel cylinder 30 and the reel 10, where the air forms an air bag.

Fig. 3 illustrates a prior-art roll 100 for use in a reeling or winding device that makes use of belt support, which roll 100 is composed of an axle 101 and of a roll mantle 102. On the roll mantle 102, there are relatively deep guide grooves 103 parallel to the circumference of the roll mantle 102. In the figure, on the left half of the roll mantle 102, four belts 110 are illustrated, on whose outer faces there are prior-art grooves 111. On the inner faces of the belts 110, there are projections fitting into the guide grooves 103 on the roll mantle, in which way movement of the

belts 110 on the face of the belt roll 100 parallel to the axle 101 of the belt roll 100 is prevented.

Fig. 4 is a corresponding illustration of a roll 200 in accordance with the present invention for use in a reeling or winding device that makes use of belt support, which roll 200 consists of an axle 201 and of a roll mantle 202. Also in this solution, in the roll mantle 202, there are relatively deep guide grooves 203 parallel to the circumference of the roll mantle 202, into which grooves the projections provided on the inner face of the belt 210 are fitted. Also in this figure, on the left half of the roll mantle 202, four belts 210 are illustrated.

In the roll mantle 202 of the roll 200 in accordance with the invention shown in Fig. 4, there is also a second groove 204, which runs around the roll mantle 202 substantially in spiral form and which extends across the axial 201 width l of the roll 200. The depth h of this groove 204 is about 0.3...1.5 mm, preferably about 0.3...1.0 mm, and its width d is about 20...150 mm, preferably about 35...100 mm. The groove 204 must be relatively wide in order that the inner face of the belt 210 should be pressed into said groove 204 during running. The tension of the belt 210 is, during operation, about 20...25 kN/m (kilonewton per metre), and, as the inner face of the belt 210 is pressed into said groove 204 during running, a similar groove is "copied" in the outer face of the belt 15. This groove that has been "copied" in the outer face of the belt 204 operates as an air channel in the nip between the roll 200 and the reel/roll 10 that is being formed, along which channel the air that has arrived in front of the nip and that has been gathered between the reel 10 and its outermost web layer can be discharged through the nip, and also in the axial 201 direction of the roll 200 out of the ends of the reel/roll 10. For this second groove 204 the name vent groove is used. The cross-sectional form of the groove 204 can be, for example, a gentle arc, but since the width-to-depth ratio of the groove 204 is relatively large, all groove forms in which there are no sharp edges which abrade the belt 210 operate here well.

With this arrangement, no separate groove 111 is needed which is machined into the outer face of the belt 110 in a set of belt rolls. Thus, in a solution in accordance with the present invention, it is possible to use a standard belt 210 with a smooth outer face. The service life of a smooth standard belt 210, as compared with a grooved belt 110, is longer. The spiral-shaped vent groove 204 on the roll 200 mantle 202 has not been synchronized in relation to the length of the belt 210, in which way uniform wear of the belt 210 is guaranteed.

In the following, the patent claims will be given, and the details of the invention can show variation within the scope of the inventive idea defined in said claims and differ from what has been stated above by way of example only.

Claims

1. A reel-up/winder, comprising one or several members (11,12;30...34) that support the reel/roll (10) to be formed onto a reel/roll spool (16), of which members at least one support member is a set of belt rolls (12;30...34), which consists of a belt loop (15, 34) which is supported by means of at least two rolls (13,14;30,31), whose axes are substantially parallel to the axis of the reel/roll spool (16), **characterized** in that into the outer face of the mantle of at least one roll (13,14;30,31) being in nip contact with the reel/roll (10) to be formed in said set of belt rolls (12;30...34), a substantially spiral-shaped groove pattern (204) has been formed, which extends across the axial width (l) of the roll mantle (202).

2. A reel-up/winder as claimed in claim 1, **characterized** in that it comprises a first winding drum (11) and a second winding drum arrangement (12), which consists of a first belt roll (13), of a second belt roll (14), and of adjacent endless belts (15) fitted around said belt rolls, the web (W) running through a first nip (NP_1) formed between the first winding drum (11) and the paper roll (10) and through a second nip (NP_2) formed between the second winding drum arrangement (12) and the paper roll (10) and being wound onto a roll spool (16), whereas into the outer face of the roll mantle (202) of the first belt roll (13) being in nip contact with the paper roll (10) to be formed in the second winding drum arrangement (12), a substantially spiral-shaped groove (204) has been formed, which extends across the axial width (l) of the roll mantle (202).

3. A reel-up/winder as claimed in claim 1, **characterized** in that it comprises a reel cylinder (30), along with whose circumference the web (W) runs before it is transferred, through a nip (N) formed by the reel cylinder (30) and by a reel spool (16) resting on support rails (35), onto the circumference of the reel (10) that is formed around the reel spool (16), and which reel-up further comprises an endless belt (34), which runs as guided by guide rolls (31...33) and through the nip (N) between the reel cylinder (30) and the reel (10), and which belt (34) supports the web (W) when the web arrives in the reel-up and until the web (W) is reeled around

the reel (10) that is formed onto the reel spool (16), whereas into the outer face (202) of the mantle of the reel cylinder (30) being in nip contact with the paper roll (10), a substantially spiral-shaped groove (204) has been formed, which extends across the axial width (l) of the mantle (202) of the reel cylinder (20).

4. A reel-up/winder as claimed in any of the claims 1 to 3, **characterized** in that the depth (h) of said groove (204) is, at its deepest point, about 0.3...1.5 mm, preferably about 0.3...1.0 mm.

5. A reel-up/winder as claimed in any of the claims 1 to 4, **characterized** in that the width (d) of said groove (204) is about 20...150 mm, preferably about 35...100 mm.

PCT

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(71) Applicant *(for all designated States except US)*: VALMET CORPORATION [FI/FI]; Panuntie 6, FIN–00620 Helsinki (FI).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: NISKANEN, Heikki [FI/FI]; Satakunnanpolku 37, FIN–04400 Järvenpää (FI).

(74) Agent: FORSSÉN & SALOMAA OY; Yrjönkatu 30, FIN–00100 Helsinki (FI).

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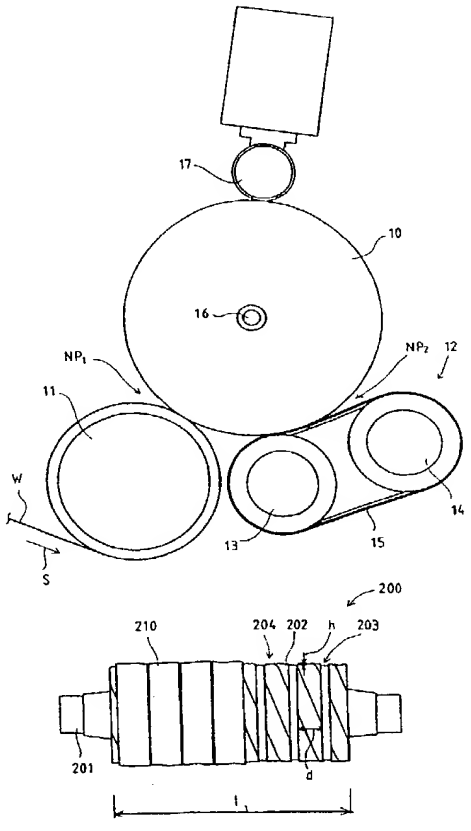
(54) Title: REEL–UP

(57) Abstract

A reel–up/winder, comprising one or several members (11, 12) that support the reel/roll (10) to be formed onto a reel/roll spool (16), of which members at least one support member is a belt support member (12), which consists of a belt loop (15) which is supported by means of at least two rolls (13, 14), whose axes are substantially parallel to the axis of the reel/roll spool (16). Into the outer face of the mantle of at least one roll (13, 14) in said belt support member (12), a substantially spiral–shaped groove (204) has been formed, which extends across the axial width (l) of the roll mantle (202).



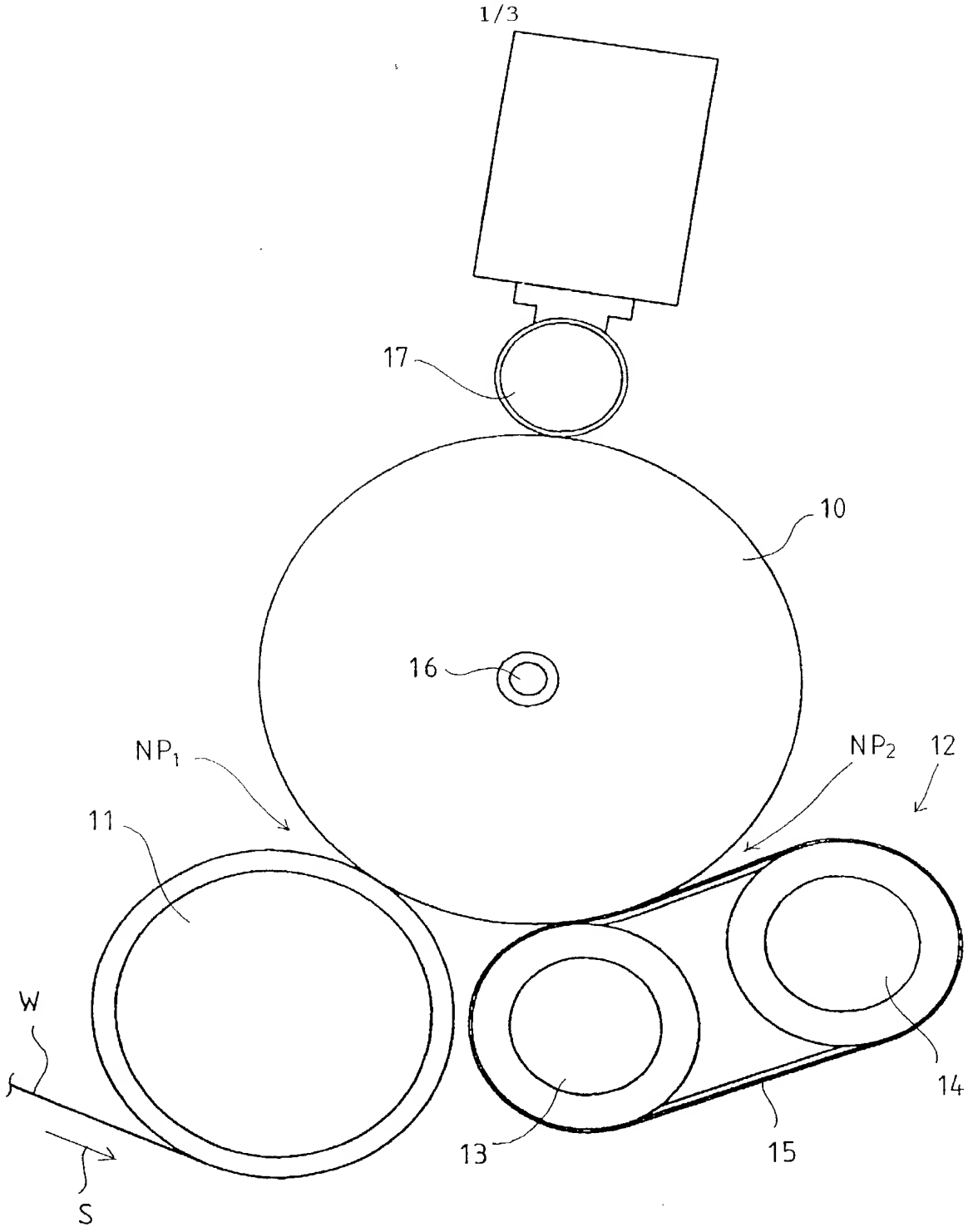
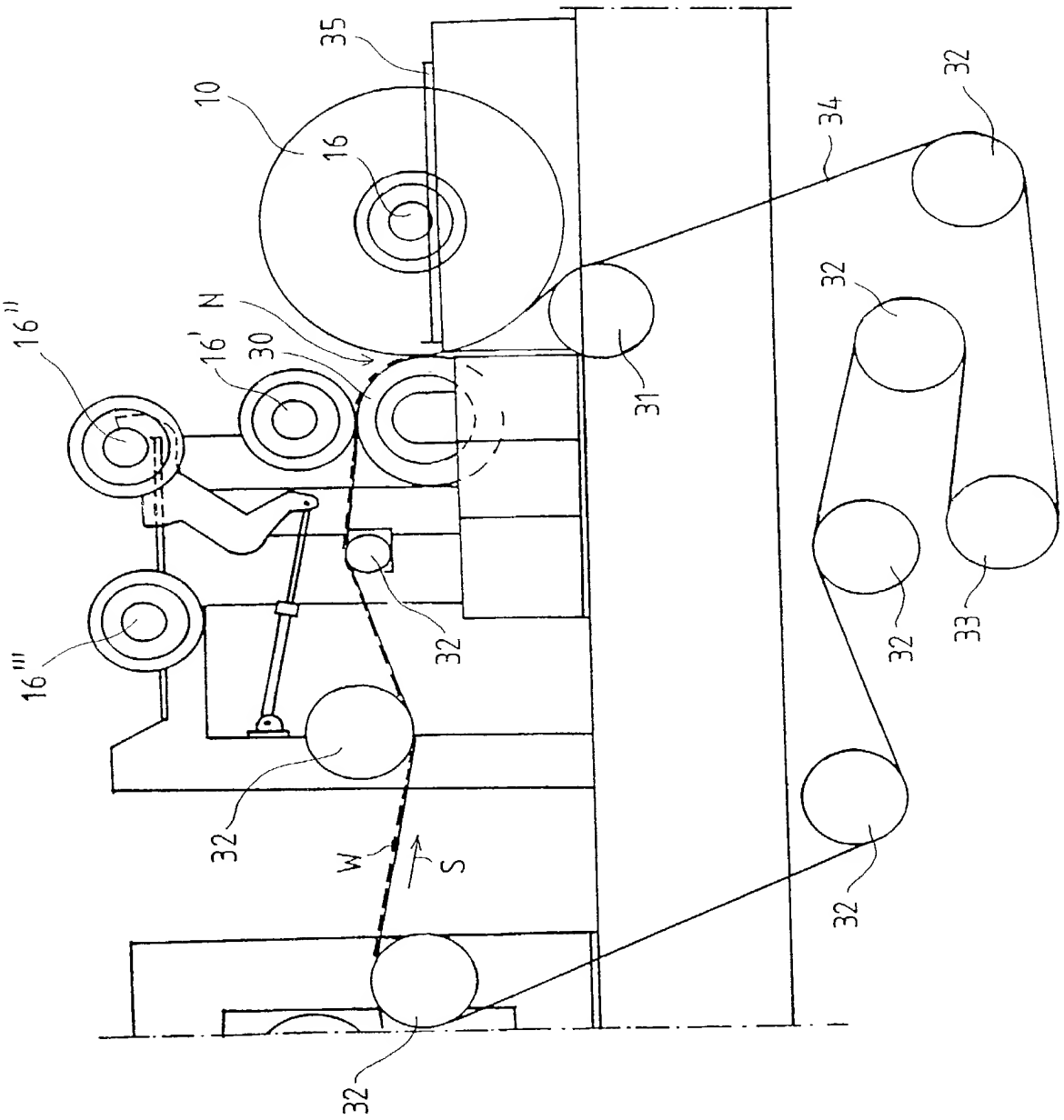


FIG.1

FIG. 2



Prior Art

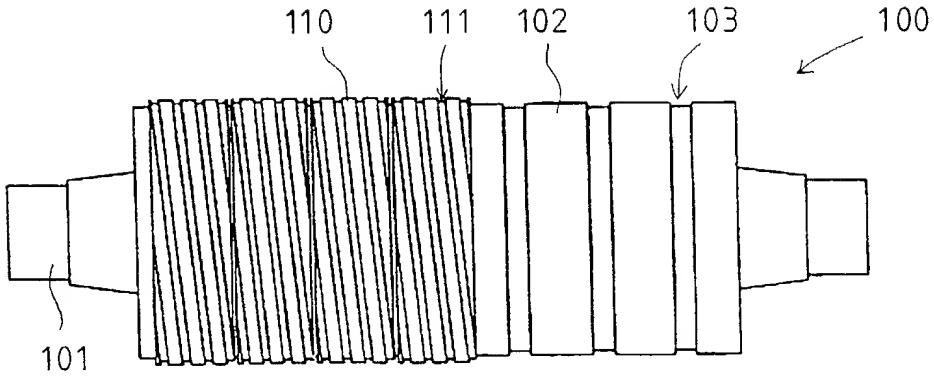


FIG. 3

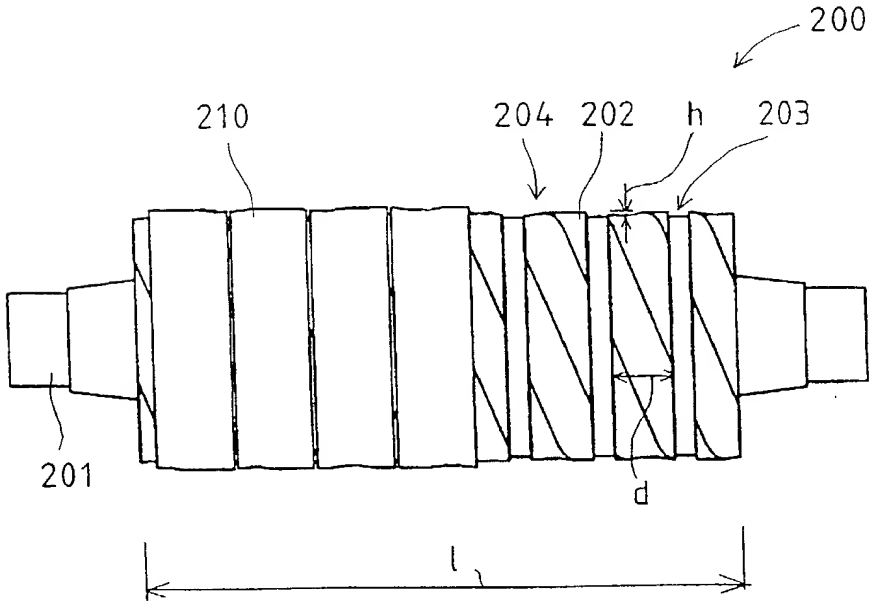


FIG. 4

Docket No.: 990.1234

U.S.A.
DECLARATION AND POWER OF ATTORNEY

As the below named inventor, I hereby declare that:
My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled: **Reel-up**

the specification of which (check one)
__X__ is attached hereto.
_____ was filed on _____ as Application Serial No. _____ and was amended on _____ (if applicable). I Hereby authorize and request my attorney, Steinberg & Raskin, P.C. of 1140 Avenue of the Americas, New York, New York 10036 to insert the filing date and application number when known.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose all information which is known to us to be material to the patentability of this application as defined in Title 37, Code of Federal Regulations §1.56.

I hereby claim priority benefits under Title 35, United States Code, §119 of any foreign and/or provisional application(s) for patent or inventor's certificate listed below and have also identified below any foreign and/or provisional application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

PRIOR APPLICATION(S)			Priority claimed
980908	**Finland**	**April 24, 1998**	**X** Yes / No

I Hereby claim the benefit under Title 35, United States Code, §120 of any United States applications(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

PCT/FI99/00321	**April 21, 1999**	**pending**

And I hereby appoint
Martin G. Raskin, Registration No. 25,642,
Harold D. Steinberg, Registration No. 17,255,
Joshua L. Raskin, Registration No. 40,135,
Anthony L. Meola, Registration No. P44,936,
Jason E. Hardiman, Registration No. 36,157

my attorneys, with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith; correspondence address:

STEINBERG & RASKIN, P.C.
1140 Avenue of the Americas
New York, N.Y. 10036;
Telephone: (212) 768-3800; Fax: (212) 382-2124.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of first inventor	**Heikki NISKANEN**
Inventor's signature	Heikki Niskanen
Date	25. September 2000
Residence	**Järvenpää, Finland** FIX
Citizenship	**Finnish**
Post Office Address	**Satakunnanpolku 37, FIN-04400 Järvenpää, Finland**

Full name of second inventor	
Inventor's signature	
Date	
Residence	
Citizenship	
Post Office Address	